

least is true, that if an elementary text-book is to appeal to young people it must have something of the freshness of the fields and of the fragrance of their plants.

The great merit of the text-book by Prof. Neilson Jones and Dr. Rayner is that it has freshness and fragrance. The art whereby the authors have cultivated these qualities so successfully is, as becomes good art, not apparent. They have taken the old themes; but the setting is simpler. As is essential for the writing of a good book, the authors have morphological minds, and hence their work is well proportioned. They write easily and simply; the careless English so frequently employed by writers of scientific and other literature is rarely used by them. Now and again they fall from grace—as, for example, in the use of “up” thrice on pp. 2 and 3; but in general the histology of construction—the phrasing—is as good as the morphological plan is sound. That plan consists in the distribution of the subject-matter under three headings: the plant as a machine (a “works” would surely be better), the plant as a begetter of machines, and the plant as a citizen of the world.

In the first division the main facts of plant physiology and morphology are described—experimental demonstrations being relegated to the end of the chapters; in the second section growth and reproduction, cell division and heredity are dealt with; and in the last section the ecology of plants is taught in a manner altogether fresh and delightful. From the point of vantage of a beech clump in the Berkshire Downs the authors survey the vegetation and show the near and far plant associations, plant societies, and the open and closed formations. What is no less acceptable, they spare their readers the overgrowth of terminology which, unless it be pruned hard, will choke the young plant of ecological science, and prove once again the truth of the old adage that “Botany is easier to learn than its nomenclature.” The two former sections of the book are treated in a more conventional manner, and it may be that newness of presentation of physiological and morphological facts is as unnecessary as it is undoubtedly difficult.

If, as is to be hoped, a new edition of this book be called for, the authors might, perhaps with advantage, consider the advisability of jettisoning some of the wealth of information which they have included in the present edition. For example, alternation of generations is a subject which in its fullness makes a fine and impressive story, but it is small and unexhilarating beer when taken only in the fern. If alternation were to go, embryo-

sacs might go also—that is, be left for later studies. The desire “to cover the ground,” though warmly approved by publishers, is one which should be ruthlessly suppressed by every writer of an elementary text-book on botany. It would also be well to transfer the chapter on the soil which concludes it to an earlier place in the volume, for this chapter should certainly come before that on ecology, and would be aptly placed in that section of the work which deals with osmotic phenomena and the absorption of water by plants.

F. K.

British Coal-fields.

Coal in Great Britain. By Dr. W. Gibson. Pp. viii+311+vihi plates. (London: Edward Arnold, 1920.) 21s. net.

THE need for a small book giving within a reasonable compass a trustworthy summary of the essential characteristics of the coalfields of Great Britain has long been felt, and, as might be expected from the high qualifications of the author, the present volume goes far indeed towards filling this want. The first few chapters have been practically rewritten from an earlier book by the same author entitled “The Geology of Coal and Coal Mining,” but they have been amplified and brought up to date. If, however, any fault is to be found with this general portion, it is that the author has scarcely availed himself so fully as he might have done of the most recent researches on the subject, such as the monograph on the constitution of coal by Drs. Stopes and Wheeler, or the results attained by the admirable micro-sections of coal produced by Mr. Lomax. Possibly also the paragraph on the classification of coal might have been considerably expanded with advantage to several classes of readers.

It may be noted in passing that 6572 ft. is now no longer the greatest depth reached by a diamond bore-hole. This is the depth of the Paruschowitz boring, but it was surpassed some years ago by the Czuchow bore-hole, also in Silesia, which reached a depth of 7350 ft. The two chapters dealing with the stratigraphy of exposed and concealed coalfields respectively are very well written and illustrated, and should make the principles of this somewhat obscure subject intelligible even to the general reader, whose demands the author has obviously kept in view throughout the book.

The second part, which occupies about two-thirds of the work, consists of descriptions of the coalfields of Great Britain and Ireland. Naturally,

the space that can be devoted to each is very limited, and, as the author himself points out in his preface, many details which may assume considerable local importance, but are relatively insignificant from a more general point of view, have perforce been omitted. The salient features of each field have, however, been carefully studied, and are stated in such a way as to give a sufficiently clear view of their various characteristics; perhaps it might have been preferable to have subdivided the coalfields of Scotland, and to have devoted at least two chapters to these, instead of dealing with all of them in one, although no doubt that chapter is relatively a long one. Whilst there are necessarily omissions here and there, partly for lack of space, as has already been pointed out, and partly because no two geologists are at all likely to agree as to the relative importance of certain features, actual mistakes are decidedly rare.

It might have been desirable to devote more care to the sketch-maps of the coalfields, for they are by no means so clear as they might have been made; for example, in the map of the North-umberland and Durham coalfield it is doubtful whether a certain line lettered as a dyke of igneous rock is intended to represent the author's idea of the course of a possible dyke of such rock, or whether it is meant for the approximate line of the great fault known as the Ninety Fathom Dyke. At the same time, it is only right to admit that the representation of geological maps in black-and-white upon a very small scale is by no means an easy matter. The author may fairly be congratulated on having compressed so much useful information within the limits of a small but well-balanced volume, and it is fortunate that it appears at a moment when the importance of an accurate knowledge of the coalfields of the country is becoming generally recognised.

H. L.

Practical Aeroplane Photography.

Airplane Photography. By Major H. E. Ives, U.S. Army. Pp. 422. (Philadelphia and London: J. B. Lippincott Co., 1920.) 18s. net.

MAJOR IVES was formerly officer in charge of the experimental department of the photographic branch in the American Air Service, and as such he and his collaborators have had access to the information, photographs, and drawings supplied by the Allies to the United States. He has therefore had a unique opportunity of compiling a book describing the practice of air photo-

graphy in the war and the apparatus employed, an opportunity which has probably not been afforded to any other individual. The work undertaken has been, on the whole, well done, and an interesting book results. The numerous well-printed illustrations form one of the most noteworthy features; they include not only photographs of apparatus, diagrams, and interesting air views, but also many reproductions from the secret official publications of the Intelligence Branch of the British War Office, which have not hitherto been available in England. When looking through the 208 figures, one notices that in a few cases their source is acknowledged, but in the majority of cases figures are copied from English, French, or Italian sources without acknowledgment. Whatever may be said of this free use of English official photographs, the direct reproduction of five well-known diagrams drawn, we believe, by Capt. Durward, R.A.F., and of two tables copied from M. Clerc, without reference to their authors, can scarcely be passed without comment.

The sections of the book dealing with apparatus and materials are distinctly good. The author has selected his material well, and the only inaccuracy noted is in the description of the Williamson film camera. In describing tilt-recorders, the Goerz type only is figured and mentioned, though the Zeiss type was more commonly employed by the Germans. In his account of aerial photographic methods and the utilisation of photographs, the author is less fortunate, probably having little first-hand knowledge. His treatment of stereoscopy seems somewhat superficial, while his chapter on map-making is quite unsound. He has adopted the untenable view that a series of overlapping prints taken by a plane flying level at a constant altitude constitutes a complete pictorial map of the ground. This view may possess an element of truth when the ground is flat, but it cannot be used as a basis for aerial survey. It has already called down the contempt of surveyors, and in 1916 led the General Staff of the French Army to prohibit the use of photo-mosaics and squared maps made from them. Under the impression that an assemblage of photographs—or a photo-mosaic, to use a more precise term—is a map, the author goes on to give a useful description of the method by which such a mosaic is made, but is, in consequence, confused when he tries to introduce the work and suggestions of Bagley. Aerial map-making can be developed only by recognising that, while a photograph may seldom itself be regarded as a map, it does give a representation of the ground from which an accurate map can be compiled (so long as